

MONTHLY JOURNAL OF  
THE MUSHROOM GROWERS'  
ASSOCIATION

# MGA

## BULLETIN

DECEMBER, 1961

NUMBER 144

### CONTENTS

	Page
Editorial : Watch That Bank Balance ...	493
Calypso : Mushrooms Galore (F.P.) ...	494
Cartoon ...	494
Recent Work on the Control of the Worthing Phorid :	
Dr. N. W. Hussey (GCRI) ...	495
Book Review : Mushrooms and Truffles (R. Singer) : RLE ...	505
Say it With Flowers ...	505
Nitrogen Analyses on Compost : Dr. R. L. Edwards ...	506
Freeze-Drying Mushrooms in Canada ...	507
Miss Rachel Owen Marries ...	507
Worthing Phorid Annihilated ...	510
U.K. Production up 14% this year ...	511
Mushrooms Over the Air ...	511
More Publicity is Essential : A. L. A. Dredge ...	514
Fuel Oil Rebate ...	514
MGA Research Committee at Fairfield, Lancs.	521
MEMBERSHIP LIST ...	527
Small Advertisements ...	548



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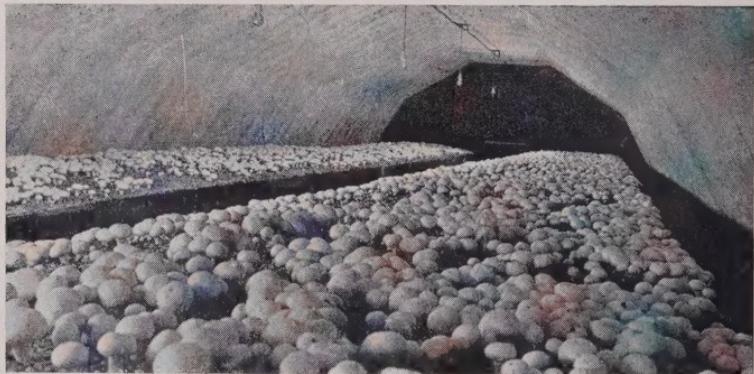
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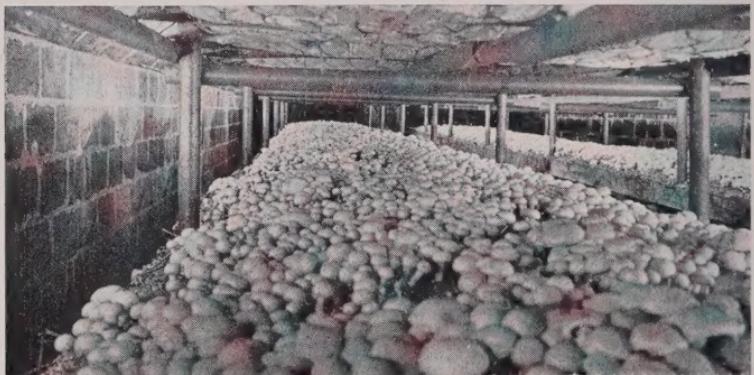
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DEC. - 1961  
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**EDITORIAL**

**WATCH THAT BANK BALANCE**

I suppose that Christmas time is about as good a time as any to talk about profit margins for it is certainly a time when the money goes really round and round.

From time to time the world of mushroom growers is startled by reports of heavy yields on this farm or that and of sustained production over a complete year, giving an annual figure per sq ft of bed at anything up to 10 or 12 lb and sometimes even higher than that. But what does that mean in terms of net profit? Is this high production grower fully deserving of the many envious glances which are turned in his direction? Is it a fact that high profits are necessarily linked to high production? The truth of the matter is that figures, on their face value, can often lie, not only in mushroom growing but in many other branches of horticulture and agriculture.

Let's take milk production, for that is something with which I am also familiar. There are many milk producers who can substantiate their claim that their production of milk per cow per year is over 1,500 gallons against a national average of about 800 gallons yet this certainly does not mean that the 1,500 gallon man makes nearly twice the profit of the lower producer, for the latter may well be a low cost-low production man, relying almost entirely on straw, hay and hay products like silage, producing every single gallon from on-the-farm products. Your high production producer may rely on his own farm products for cow maintenance and maybe one gallon of milk per cow per day, feeding expensive cake at £34 per ton in order to produce more and more milk. He may too, have more expensive cows, equipment and buildings. Yet his profit per gallon can be so low that his total profit per cow may well be considerably less than the low cost producer.

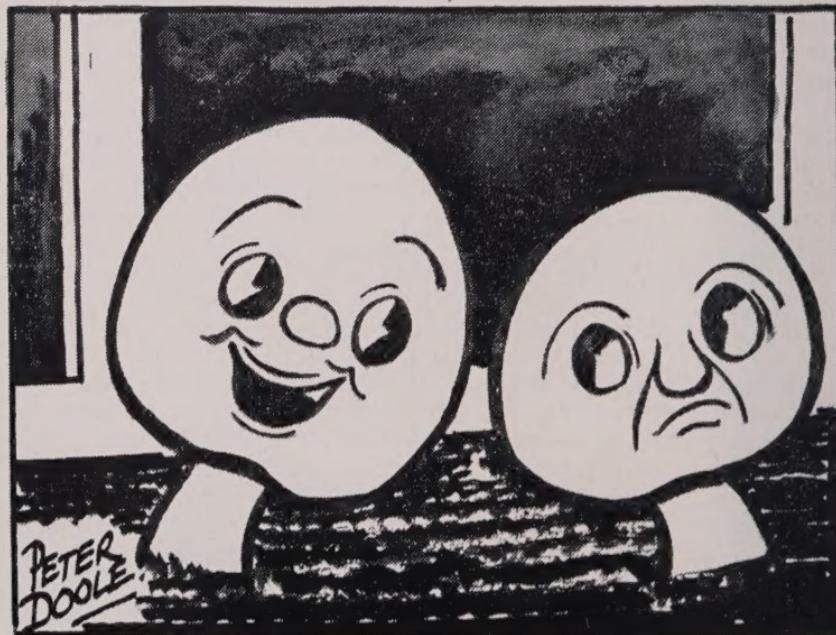
So it is with mushrooms. Buildings, equipment, labour costs and so on and particularly bed depth, all have direct bearing on profits. All other things being equal, it is the bank balance which gives a true indication of profitability so, for what it's worth this Christmas, watch that bank statement. It's as good a thermometer, barometer and what have you, as ever there was. Happy Christmas.

WRA

## MUSHROOMS GALORE!

I drove afar to visit, one weekend,  
A scientific prodigy and friend  
Whose way of growing 'rooms astounds us all,  
Whose story sounds fictitious-like and tall,  
Whose compost hangs like beehive barframes there,  
And is contained 'twixt "sheets" of netting-wire  
Which act as casing on the vertical,  
With yields down either side identical.  
Beneath each barframe hangs a 'spout' trough-wise,  
From which osmotic'ly the nutrients rise.  
To pick the crop a nylon thread held taut,  
Detaches all (at one fell swoop onslaught),  
Depositing in baskets until brimmed,  
Such spotless 'rooms and all already trimmed  
(Or should I say that trimming is foregone)  
Detached from netting-wire where they were born.  
A pound per foot per week is yielded clear  
And this for over fifty weeks a year.  
At last, alas!, speech left me—— I was dumb——  
I stood aback, aghast, and all benumb,  
For how could anyone compete with this?  
I stood, methought, astride a great abyss,  
Then utterly disgusted slammed the door  
Which set-off fire-alarms on every floor!  
... I groped about from underneath the clothes,  
(From which the steam of perspiration rose),  
Till off I switched the rude awak'ning ring,  
And found a nightmare's ghost——the horrid thing!

F.P. (BELFAST)



Cheer up, mate! — They say half the growers get canned at Christmas!

# RECENT WORK ON THE CONTROL OF THE WORTHING PHORID

Dr. N. W. Hussey

Glasshouse Crops Research Institute, Littlehampton

## Introduction

Although many insecticides are available for control of the mycelial feeding Phorid *Megaselia halterata* Wood the grower is still experiencing serious trouble especially in warm weather. Indeed Atkins (*in litt*) commented recently "1961 will go down in history as second only to the year of the Worthing Phorid". Most of the existing recommendations are concerned with aerial sprays and dusts and, although these materials are efficient at the time of application, they often fail to give the grower satisfactory control. Hussey (1958) drew attention to the need for directing control techniques to the compost and bed-surface during the period of active mycelial growth. To date however only Moreton and John (1955) and Wood (1956) have suggested the use of specific materials incorporated in compost. There is no published information available on the biological efficiency of any insecticide against Phorids.

During the past year numerous observations have been made on oviposition and larval development in compost which has either been treated directly, or covered with a treated casing layer.

All the figures given are based on 30g. samples of compost (about a handful) from which the larvae are extracted by soaking in water above a fine mesh. The larvae sink through the gauze to the bottom of the vessel but only about 20% are recovered. Despite this low recovery,

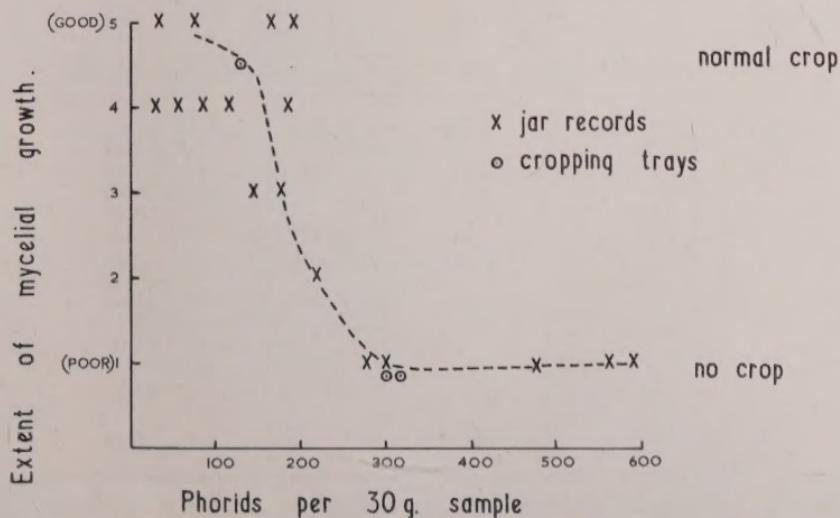


FIG. 1. Effect of larval density of *M. halterata* on mushroom growth.

differences between given samples are consistent. Subsequently the compost is washed through a series of sieves with jets of water to recover the pupae. Eggs are not easy to extract and for the purposes of the present article have been ignored except where referred to specifically.

### **Population level at which damage occurs**

Moreton and John (1955) claimed that in laboratory experiments populations of 1,000/sq. ft. in a bed six inches deep "did not have a marked effect on cropping". This population roughly corresponds to 6 per 30g. sample. However on one farm last year we recorded trays in which the population density was as high as 400/30g. It is difficult to obtain accurate data on the relation between Phorid populations and yield, owing to the impossibility of obtaining a reasonably uniform infestation of experimental trays. Our information has therefore to be based on 'scoring techniques' of mycelial development in transparent experimental containers. But on one heavily infested farm we were able to sample a house which was subsequently emptied during the first flush due to the poor crop. Trays which formed no mushrooms, contained 300 larvae, and those which seemed to be developing a normal first flush 129 per 30g. FIG. 1 illustrates the correlation between a number of different populations and mycelial growth and it is obvious that levels above 100/30g. must be regarded as damaging.

### **Pattern of Population Growth**

TABLE 1 illustrates the effect of degree of mycelial development upon Phorid oviposition. Jars, each containing 60g. of compost, were spawned at different times and maintained in incubators at 75° F. until required. Five replications of each stage of spawn development were exposed to oviposition in a heavily infested commercial house for seven days.

**TABLE 1**

#### **Phorid oviposition in compost spawned for different periods**

<i>Duration of spawn-run before oviposition</i>	<i>Degree/mycelial colonization</i>	<i>Mean Number Larvae per 30g.</i>
0 days	Nil	7.3
4	Fluffing around grain	13.8
7	½ volume colonized	38.5
11	¾ , , ,	67.7
14	Fully run	11.6
18	Fully run+	0.3

As the volume of actively growing mycelium increases, so does its attractiveness to Phorids, but once the compost is fully colonized

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ideal medium for spawn run and helps to avoid greasy conditions, lack of aeration, and over wet compost - all of which delay mycelium growth. The spawn is able to make more rapid use of the food provided. It establishes itself more quickly and this is again a great help in preventing diseases and weed fungi. The faster the spawn grows and fills the compost the less likelihood is there of disease and weed fungi becoming serious competitors. A quick spawn growth also gives a quicker ultimate production.

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oviposition rapidly declines. Many other experiments have shown conclusively that eggs are not laid in unspawned compost even if it is surrounded by spawned material. The importance of the degree of mycelial colonization prompts one to consider methods by which the spawn-growth could pass its optimum period of attractiveness within a fly-proof spawn-running room. The data in TABLE 1 show that the mycelium had colonized the compost sufficiently to reduce its attractiveness to Phorids within 14 days at 75° F. Spawn running is normally carried out for 14 days at this temperature so that if the spawn-rate used in practice was equivalent to that used in these experiments the mycelium would have developed to the 'safe' stage by casing. The rate used, 20 grains/60 g., is roughly four times the normal commercial practice of 1 carton to 25 sq. ft. There is, therefore, scope for further work on the possibly beneficial effects of heavier spawning, preferably sown by the through-spawning technique.

Another way of ensuring that mycelial colonization of the compost has reached an advanced stage would be to retain trays in the spawn-running room for three instead of two weeks. Although such a method would have practical difficulties it might be of value in the light of the following experimental results. To fit in with farm practice it was necessary to transfer the experimental trays from one spawn-running room to another. Exposure of the compost to heavy attack by large numbers of adult Phorids accounts for the high initial larval population in these trays (TABLE 2). After the three week spawn-run the experimental trays were interspersed between, and cased at the same time as other trays run for the normal period. Samples were removed at intervals from both treatments in the cropping house.

**TABLE 2**  
**Phorid populations within trays spawned for different periods**

Days after casing	..	..	0	7	21	28	54
2 week spawn-run	}	Larvae	0	7	19	2	0
3 week spawn-run			1	30	13	2	0
2 week spawn-run	}	Pupae	6	12	59	100	27
3 week spawn-run			68	101	161	37	23

To interpret the data obtained from experiments on commercial farms the influence of temperature on Phorid development (TABLE 3) must be understood. The observations were made in West Sussex, during August and September when the average temperature, based on meteorological records at Littlehampton, was about 60° F. As the generally fine weather over this period may have increased the mean development rate I have assumed a prevailing average cropping temperature of 63° F. At the prevailing temperature the duration of the egg stage would have been four days and that of the larva 14 days. From TABLE 2 it is apparent that the peak of the larval and pupal populations was at least a week earlier

TABLE 3

## Influence of temperature on Phorid development

Temp. (°F.)	Mean Duration of stages (days)			Egg-adult
	Egg	Larva	Pupa	
75	2	4.5	7.5	14
70	3	8.0	12.0	23
65	3.4	12.3	21.0	37
50	7.5	33.0	65.5	106

in trays with the longer spawn-run. This demonstrates that once the mycelium has developed to a certain stage, its attractiveness to ovipositing Phorid females decreases. If account is taken of the  $2\frac{1}{2}$  week development period from egg to pupa it is also obvious that, in the above experiment, the greater part of the infestation of the compost, run for three weeks, occurred within the spawn-running room.

TABLE 4 illustrates data obtained from insecticide trials which also serve to emphasise the peak in larval numbers occurring from 2—3 weeks after casing. Bearing in mind the incubation and developmental periods of the young larvae there is no doubt that the bulk of the eggs was laid during the first week after casing. All the examples given showed peak pupal counts a week later which is also consistent with this interpretation. At the Weston Conference Hussey and Wyatt (1961) suggested that if a compost was maintained free of Phorids up to casing there would be little chance of serious trouble. While the results reported here show this to be generally true (only Crop 5, which left the spawn-room with a high population, reached a serious level), there can be more oviposition in the first week within the cropping house than was previously believed.

TABLE 4

## Mean Larval populations in various commercial crops at intervals after casing

Days from casing	0	7	14	21	24	28	35	54
Crop 1	0	5.2	—	78	—	—	5	—
Crop 2	0.5	6.8	—	19.5	—	2	—	0
Crop 3	1.2	—	7	0	—	—	—	0
Crop 4	1.5	2.5	—	—	—	—	0	—
Crop 5	170	—	—	273	—	53	19	—
Crop 6	—	38	—	—	19	—	—	—
Crop 7	2	—	25	—	—	—	—	—

## Chemical Control

Hussey and Wyatt (1960) drew attention to the beneficial effects of pyrethrins in reducing Phorid oviposition. In a series of trials with small plastic pots in which the flies only had access to the upper surface of the compost the following materials were tested.

### Surface treatment of Compost

BHC (0.8g/sq. ft.)

Malathion ,,

### Incorporation in compost

Aldrin 10 and 50 p.p.m.

Malathion 10, 20 and 50 p.p.m.

BHC 10 and 50 p.p.m.

### Casing Treatments

Diazinon 10 p.p.m.

Aldrin 10 p.p.m.

All of these treatments, compared with untreated controls, failed to reduce the number of eggs laid, and subsequent larval development was unaffected by the insecticide.

In a number of trials this year further evidence was obtained of the value of pyrethrin in reducing the number of eggs laid following surface treatment of the compost (TABLE 5).

TABLE 5

Effect of surface treatment with pyrethrin on Phorid oviposition

	Control .. .. .. ..	No. eggs/30g. compost			
		Crop 1 226	Crop 2 2604	Crop 3 70	Crop 4 116
Synergised Pyrethrin (.002g. Pyrethrin/sq. ft.)	.. ..	65	81	2	—
Unsynergised Pyrethrin (.008g. Pyrethrin/sq. ft.)	.. ..	—	—	—	16

The limited trials so far completed suggest that rates up to .005g. of *actual* pyrethrin/sq. ft. may be safely applied to the bed surface without phytotoxic effects (= 5 lb. 0.2% per 1,000 sq. ft.). In practice application rates may well prove to be safe above this level as the range tested to date has been very wide.

As pyrethrin tends to break down in light the material would normally only be used in spawn-running rooms which, for some special reason, could not be made fly-proof. Some pyrethrin dusts develop a mould during spawn-running and although this did not seem to affect cropping in our trials it would probably be more satisfactory to use emulsions.

The outstanding result in the search for a satisfactory control of Phorids is the demonstration that diazinon, incorporated in the compost before spawning, can produce high mortality in the young larvae. Two trials have been made, each with six replications of two rates of diazinon. Oviposition over seven days was apparently not greatly affected but the larval survival in the treated compost was significantly reduced (TABLE 6).

**TABLE 6**  
**Effect of diazinon on Phorid development**

Treatment	Mean No. eggs/30g.	Mean No. pupa/30g. after 14 days
Control .. ..	280	47.00
Diazinon 10 p.p.m. ..	350	3.1
Diazinon 50 p.p.m. ..	130	4.5

For future biological studies it is important to notice that, even in the control treatments, the number of pupae maturing is less than one would expect from the number of eggs laid. A cropping trial on the phytotoxic effects of diazinon has been laid down at GCRI, but earlier work and that reported by **Wood** (1956) suggests that cropping should be normal at concentrations up to 50 p.p.m.

### Conclusions

The data presented in this paper confirm that *Megaselia halterata* is strongly attracted to mushroom compost only when it is being actively colonized by mycelium. After this phase, which is complete within four weeks of spawning, the oviposition rate declines, but the long pupal period causes high adult populations later in the cropping period.

The only promising chemical for preventing this build-up in the early stages of spawn-running is diazinon at 10 p.p.m. (2 fl. oz. 20% per ton) in the compost before spawning, which is worthy of further trial. Pyrethrin is also likely to be useful in spawn-running rooms from which flies cannot be excluded. Bearing in mind the possible development of resistance to chemicals it is strongly advised that such 'insurance' methods of control should be restricted to the usual fly-season from June—October. At other times it is unlikely that larvae can reach the dangerous level of 100 per handful.

The importance of sealing spawn-running rooms against flies cannot be stressed too strongly and growers should obtain considerable practical benefits even if diazinon is used only according to the existing recommendations, in the first two weeks after casing.

### Acknowledgements

Grateful thanks for assistance in the trials reported in this paper are due to **R. Thompson** of West Wittering, **McG. Bulloch** of Lyminster and **V. Forster** of Clymping.

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(Book Review)

### **MUSHROOMS AND TRUFFLES** (*World Crop Series*) BOTANY, CULTIVATION AND UTILIZATION

By R. Singer

(Leonard Hill & Interscience Publishers 1961, 60/-)

As its title indicates, this book covers a much wider field than mushroom growing. The cultivated mushroom occupies about half of the book, other chapters describing the culture of the Paddy Straw Mushroom, Shiitake Mushroom, Edible Truffle, while the possibility of cultivating Morels and other species is also discussed.

The book as a whole is rather verbose, and a lot of space is devoted to a nomenclature of mushroom species including uncompromising criticism of some writers. The author calls the cultivated mushroom *Agaricus bisporus*.

In the chapter on mushroom cultivation, pests and diseases, the author writes about his subject in rather general terms without giving definite, easy-to-follow directions. This comment is not offered as a criticism but it is relevant to the type of reader likely to find the book interesting. It is a monograph on its subject, not a manual of practical mushroom growing and is likely to appeal to a studious person interested in the whole range of cultivated fungi rather than to the average commercial grower.

The book is very attractively printed and bound (as indeed it should be at the price), with many excellent line drawings and photographs including some in colour. There is a good glossary of botanical terms, an index and a long list of references to original papers extending up to 1956.

RLE

### **SAY IT WITH FLOWERS**

Speaking at the Autumn Conference of the British Flower Association, Mr. P. J. Moss, Chief Officer to the Horticultural Marketing Council said that HMC had sponsored a national survey of the market for flowers in Great Britain.

The work is being carried out by Produce Studies Ltd., headed by Mr. David Pickard, who recently carried out a pilot survey for the MGA.

Mr. Moss, who suggested aiming at doubling the sale of flowers within the next five years said "It is about time the flower industry started to sell flowers. It requires a positive and expansionist outlook, and you must be prepared to adjust your methods in accordance with the market research results".

# NITROGEN ANALYSES ON COMPOST

Dr. R. L. Edwards

Following a suggestion made during discussion on a paper at the MGA Conference at Weston-super-Mare in 1960, the Executive Committee decided to sponsor a series of analyses of compost, arranged to test the reliability of sampling and analysis and the possibility of basing additions of nitrogen on the results of analysis of samples taken at the first turn.

A total of five batches of compost were sampled for analysis, and analysed by two, three or four laboratories.

In all cases two separate sections of the stack or two shelves in the house were sampled and analysed separately. In two cases urea was added to part of the stack, and the samples taken after peak-heat represented parts of the stack with and without urea. In one case urea was added to the whole stack, and both subsequent samples were from urea-enriched compost.

## Agreement between analyses

The agreement between results from three of the laboratories is excellent. Out of 14 sets of samples, in 7 sets the difference did not exceed 0.1% N and only in two cases did it exceed 0.2% N. There were greater differences in a few of the results from the fourth laboratory.

The agreement between unsupplemented samples from different parts of the stack was also good; the average values for total N in different sections of 4 stacks being 2.00 and 2.00, 1.89 and 2.04, 1.98 and 1.93, 1.78 and 1.76, all sampled at first turn.

In stacks or sections of stacks to which urea had not been added there was a rise in nitrogen from 1st turn to "after peak-heat":—

Crop No.	1st turn	After peak-heat	Increase	Av. increase
8 H	1.78	2.03 % N	0.25	0.29
	1.76	2.08	0.32	
8 G	2.0	2.27	0.27	

With approx. 4 lb. urea per ton added at second turn the corresponding figures were:—

Crop No.	1st turn	After peak-heat	Increase	Av. increase
8 G	2.00	2.39	0.39	0.46
	1.98	2.47	0.49	
	1.93	2.43	0.50	

the rise in total N %, equivalent to 4 lb. urea/ton of manure is 0.27%. The observed rise is 0.17, about 60% of this.

These crops are not yet finished, but there will obviously not be any close relation between total N % and yield in this series.

Moisture % was determined on all samples and shows similarly good agreement.

### Conclusions

Samples have been taken from separate parts of stacks at first turn on a commercial farm, and analysed by two to four laboratories. There was good agreement between laboratories and between results on different parts of the same stack. There was a general rise in total N % from first turn to after peak-heat and this was higher where urea was added to the stack at second turn. It was not possible in this series to relate the yield to the total N or to addition of urea.

It is quite possible to sample at first turn, send the sample for analysis and have the result two days later in time to add urea or other nitrogenous supplement in quantity based on the analysis, at the second turn.



## ***FREEZE-DRYING MUSHROOMS IN CANADA***

Among the visitors from Overseas at the Yarmouth Exhibition and Conference in October was Mr. Irving Slack of Slack Brothers, Waterloo, Quebec, Canada.

A note in the 14th October issue of the *Financial Post* of Toronto says that Slack Brothers are investing 100,000 dollars in a radical food preservation method which combines freezing with drying. MGA members at Yarmouth will recall that a mobile freeze-drying unit was on show there.

The *Financial Post* says that Slack Brothers will be the first company in Canada to install a unit of this kind and the Company hopes to deal with 10,000 lb. mushrooms daily. Slacks have been growing and canning mushrooms for about 50 years and current sales are in the neighbourhood of two and a quarter million dollars a year.

Freeze-drying cuts the weight of mushrooms—not the bulk—by about 85% and the freeze-dry process is based on the phenomenon that ice vapourises without melting at temperatures below freezing, if the air pressure is reduced sufficiently. Foods are first frozen and then placed in a drying chamber. A near vacuum is created and heat sufficient to vapourise the ice but not to melt it, is radiated on the food. Vapours are pumped from the chamber as they come off the food. The process takes from eight to twelve hours.



## ***BEST WISHES***

Miss Rachel Owen, Public Relations Officer to the MGA was married at Faringdon, Berks., on 28th October, to Mr. Jeremy Hamand.

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# **WORTHING PHORID ANNIHILATED**

## **Splendid Results With DIAZINON—say GCRI**

Speaking at an MGA Area Meeting held at East Grinstead on Saturday, 25th November, Dr. N. W. Hussey, entomologist at the Glasshouse Crops Research Institute, said that work on the Worthing Phorid had resulted in spectacular reductions in the larval populations if diazinon was mixed with the compost after peak-heat. He added that, with heavier spawning rates, it might be possible to obtain control without the use of insecticides at all.

The meeting was organised by the Area A Committee (Kent, Sussex, Surrey, Middlesex and London) and was presided over by the Vice-Chairman of the MGA, Mr. A. St. J. Berry, who was introduced by Mr. Arthur Jones. Other members of the Area Committee attending included Mr. H. J. Barton and Major A. L. A. Dredge.

Dr. Hussey, introduced by Mr. Berry, gave a lucid survey of the present work in progress at the Glasshouse Crops Research Institute. Special attention was drawn to promising developments in pest control. The use of aldrin ( $1\frac{1}{4}$  fl.oz., 30%/ton peat and chalk) had only proved effective against the orange larvae of *Mycophila* sp. The more common, white, larvae of *Heteropeza* could, however, be largely controlled by incorporating **gamma**-BHC in the casing material at a rate of 1 pint/10%/ton.

Work on the Worthing Phorid had resulted in spectacular reductions in the larval populations if diazinon was mixed with the compost, **after** peak-heat, at 10 p.p.m. (2 fl.oz./20% ton). Tests on phytotoxicity to mushroom mycelium and residues within the mushrooms were in progress and it was hoped that firm recommendations could be suggested by the next "fly season". Further ecological work had confirmed that nearly all the eggs were laid, in any crop, during the first three weeks after spawning. If complete mycelial colonization of the compost could be achieved within two weeks in the spawn-running rooms by heavier spawning rates, it might be feasible to control Phorids without using any insecticides at all. Mention was made of tests to be carried out on the use of an automatic aerosol dispenser which could dispense measured amounts of synergized pyrethrin every fifteen minutes into the air-space of spawn-running rooms which could not be physically sealed against flies.

Afterwards many questions were asked and answered and Mr. Berry said that it was pleasing to note that the work now being carried out at Littlehampton was largely on the lines of the programme suggested by the MGA Research Committee.

Mr. Berry expressed the hope that, next year, MGA area meetings would be far more frequent and said that MGA headquarters would be pleased to hear from any member who was willing to open his farm for a farm walk.

Dr. Hussey was warmly thanked by Major Dredge.

## **U.K. PRODUCTION UP 14% THIS YEAR**

### **Results of the 1960 Sample Enquiry of Mushroom Growers**

In October, 1960, questionnaires were sent out via County Horticultural Officers to the 60 mushroom growers in England and Wales who each produced more than 100,000 lb. in the twelve months 1958/9. These growers were asked to give revised figures for their 1959/60 production and a forecast for the year 1960/61.

Fifty-seven replies were received. The table below sets out the results of this enquiry alongside those from the main 1959 survey:—

	1958/59	1959/60		1960/61
	Final <sup>1</sup>	Forecast <sup>1</sup>	Final	Forecast
	Million lb.	Million lb.	Million lb.	Million lb.
Sample of 57 growers ..	17.248	21.470	20.428 <sup>2</sup>	23.250 <sup>2</sup>
Index .. ..	100 /	124	118	135
Estimate for all holdings..	26.7	32.8	31.4 <sup>3</sup>	36.6 <sup>3</sup>

<sup>1</sup>From original full 1959 survey.

<sup>2</sup>From 1960 sample enquiry.

<sup>3</sup>Taking account of new growers and those going out of production.

These figures show that the forecasts for 1959/60 were not in the event fully realised, partly because of disease and also the very hot dry summer. For 1960/61, however, the fifty-seven growers who replied to the questionnaire expected to continue to expand their enterprise by a further 2,800,000 lb. or some 14% of their 1959/60 final figures.

## **MUSHROOMS OVER THE AIR**

In the last few weeks and in addition to the two T.V. programmes which dealt with the Yarmouth Conference, mushrooms have received a fair show over the air.

### **In the South:**

On Southern Television's "Day by Day" programme on 26th October, Wing-Commander Stanford Tuck, a former Battle of Britain pilot and now a mushroom grower in Kent, spoke about the difficulties encountered in the production of cultivated mushrooms. He explained the great care which had to be taken on the hygiene and also the thought and work which went into the careful preparation of compost. He explained quite briefly the complete growing process from composting to the picking and marketing of the mushrooms. This programme lasted between five and six minutes.

### Louise Davies:

In her "Shopping List" programme on 13th October, Louise Davies said "Mushrooms are plentiful. Field mushrooms are in some shops as well as cultivated."

### On B.B.C. Sound

Recently in the "On Your Farm" B.B.C. programme, Mr. P. B. Stanley-Evans, a former MGA Chairman, questioned two journalists who had paid a recent visit to Common Market countries to study their economic and agricultural problems. Mr. Stanley-Evans said, "I am sure that we have a tremendous way to go in the marketing of horticulture; I am sure we all agree on that point—every horticulturist. But we are up against very great difficulties, primarily because of the perishability of our product, and the violent seasonal rise and fall. But you've all, I'm sure, heard of the Mushroom Growers' Association, and we are tackling that problem very thoroughly. We have a levy on every carton of spawn which is sold, and that levy goes towards promoting our own publicity, and a tremendous amount of thought goes into it. It's only on a small scale at the moment, but it's building up fast, and I think more efforts of that description will arise, and I'm sure they will solve that problem".

R. Trow-Smith replied:

"I can give Peter one assurance that will be carried out and that is that the Common Market countries are not considering mushrooms for their Common Agricultural Policy."

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HOUSE NO... 5

DATE SPAWNED 13<sup>th</sup> JULY

	lb.	DAY	lb.
1	31	32	-
2	50	33	-
3	-	34	246
4	-	35	38
5	757	36	-
6	149	37	43
7	388	38	-
8	-	39	-
9	224	40	-
10	(7 days)	41	150
11	-	42	144
12	-		
13	1158		
14	493		
15	-		
16	281		
17	(14 days)		
18	-		
19	122		
20	36		
21	81		
22	144	227 lb/sq/ft	
23	45	(21 days)	
24	-		
25	-		
26	-		
27	249		
28	-		
29	-	253 lb/sq/ft	
30	169	(28 days)	
31	-		



# **MORE PUBLICITY IS ESSENTIAL**

**says Major A. L. A. Dredge**

In an article in one of our daily papers at the end of October it was stated:—"British farmers should be able to earn substantially higher incomes than Continental farmers if Britain joins the Common Market. Food prices may rise slightly but this may be compensated for by a rise in national income".

These conclusions were reached by a study group of the United Kingdom Council of the European Movement in a report called "Britain's Food and the Common Market". The report mentioned that the group which would face great difficulty, British horticultural producers, is small in numbers, and it recommended that the government should buy up horticultural holdings at a generous price.

If it is decided to join the Common Market, which seems more than likely, our plight will not be as serious as that of other horticulturists, but surely we must increase our publicity subscriptions if we are to compete successfully in the future with our rivals for a share in the housewife's weekly purse. Our main competitors are egg producers, and growers and importers of various vegetables and fruit such as apples, tomatoes, bananas and other products displayed in greengrocers' shops and supermarkets all over the country.

Many of us recently listened to an address at the MGA Conference at Yarmouth by Mr. G. V. Allen, Chairman of the Publicity Committee; this was followed by an enlightened lecture by a member of the staff of a commercial publicity company. For the benefit of those who did not attend the Conference I will endeavour to give a very short precis of the matters raised. Mr. Allen pointed out very forcefully that the present spawn levy of 3d. per carton, which raised approximately £12,000, was inadequate for an efficient publicity campaign. He then introduced the speaker from the Publicity Company who gave full details of the amounts spent on advertising and television by some of our rivals. If my memory serves me right, the Egg Marketing Board are spending on television alone, £298,533 per year, while apple growers and importers of bananas are each spending approximately £150,000 on sales campaigns including advertising on television. Many more facts and figures were quoted but these examples show that producers of other food are spending large sums on advertising.

In his lecture, a well-known American mushroom scientist, Dr. Sinden, informed us that no less than 5% of the total income from the modern mushroom farm at Gossau, Zurich, was spent on publicity!

It has been suggested that we should contribute one half-penny per pound of mushrooms sold during the year. Based on production of 40 million pounds per year this would realise a figure of approximately £80,000 which should provide sufficient income to run a first-class publicity campaign.

I am not attempting to say what form the publicity programme should take, as this is obviously the responsibility of the experts who

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would no doubt work in close co-operation with the Publicity Committee. I do, however, personally feel very strongly that publicity is an insurance policy. Mushroom growers have never lagged behind other growers and the horticultural press has not been slow to praise us for our initiative and the close co-operation which exists amongst mushroom growers all over the world. It now appears that for once we have lagged behind other growers and producers. With the Common Market looming ahead, it is essential that we should increase publicity as soon as possible. It is not unlikely that the various European countries bordering on the English Channel will send more mushrooms to our markets. There is also the continual expansion of our own growers to consider. Many mushroom farms all over the country have increased the numbers of their houses and it is almost certain that some of the other horticulturists, including tomato growers, will turn to mushrooms in the future, if and when, without the protection of tariffs, they have to face fierce competition from European growers. As well as having better climatic conditions, most European growers pay lower wages and their staffs work longer hours; thus they have a big advantage over our horticulturists.

Unless we increase our publicity it is certain that supply will outstrip demand, with a consequent fall in prices. On the other hand, if demand keeps pace with supply, prices would stay at their present level and mushroom growers should continue to make reasonable profits. In either case the grower stands to gain and I therefore maintain that increased publicity is an essential form of insurance for the future.

## **THE FUEL OIL REBATE**

Members who take part in the MGA Bulk Oil Scheme are reminded that the tax of 2·2d. per gallon imposed by the Government at the last budget is recoverable by the users provided that the fuel oil has been used in direct connection with horticulture.

Whilst present arrangements are that each user shall make application direct to his nearest customs and excise office for the appropriate claim form (No. 613 SEC. 33957/1961) it is hoped that a bulk supply of these forms will be made available to the MGA Office, in which case a copy will be sent to all registered users. The period concerned is 30th June to 31st December.

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## **MGA RESEARCH COMMITTEE AT FAIRFIELD, LANCS.**

### **Excellent Work Being Done**

The MGA Research Committee, under the Chairmanship of Mr. Fred. C. Atkins, met at the Fairfield Experimental Station, Esprick, Kirkham, Lancs., on Thursday, 26th October.

Mr. A. J. Bedding, Director of Fairfield, with whom were Mr. John Rothwell (Senior NAAS Officer) and Mr. A. Jones (Chief Assistant and Recorder), welcomed the party and explained the mushroom experimental work now being carried out on the Station. He said that the work was somewhat hampered by the smallness of the unit—two cropping houses each measuring about 18' × 45' and a covered composting yard. Cropping was in large deep trays—virtually the shelf system—but in mobile frames. He hoped for the addition of one new cropping house in the near future and that would be devoted to trays. Mr. Bedding outlined the history of the work with mushrooms, which commenced in October, 1959. Basis of the compost was horse manure, to which 10% of deep litter poultry manure was added. Composting period varied from 15 to 28 days but the most consistent cropping results came from 28-day composts, after every trace of ammonia had gone. The casing material was powdered limestone and local peat, on a 50-50 weight basis. Yields were 2 lb. per sq. ft. three times a year. The best crop to date was one of 3 lb.

The peat was sterilised for 20 minutes at 212° F. in a 14 inch deep layer over Hoddesdon pipes and was afterwards covered with a tarpaulin and left for anything up to two days. At Fairfield they had found that there was less disease in the sterilised casing beds and no difference in yield.

On the question of ventilation in the growing houses, it was stated that this varied much more from wind-speed than wind direction, with a difference in the rate of fresh-air change of 0.8 to up to 6.5 when the wind rose to 25 mph.

Fairfield are in close liaison with the GCRI at Littlehampton and work is being carried out on cecids, casing material, spawning rates, picking periods and pest control in general. When the third house was completed—a peak-heat house was hoped for as well—a dozen experiments could be carried out each year.

Mr. Bedding said it had been found at Fairfield that if, a week after spawning, the spawn run was all right, all other things being equal a reasonable crop would result but if, at that stage, the run was poor then little could be done.

The visitors inspected the experimental plant with its 7" deep beds, with one experimental plot having already given 2½ lb. per sq. ft. in 11 weeks and still going strong, the show of mushrooms being then equal to a second flush.

The point was made that, from close observation at Fairfield, the value of frequent and light watering could not be over estimated.

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**MEMBERSHIP LIST**

**TO DATE**

Names in italics are of Associate Members.

**Past Chairmen of the MGA :—**

Major C. P. Whitaker, M.B.E., M.C. (1945-7)	Capt. G. P. Lawrence (1953-5)
Stanley Middlebrook (1947-8)	G. W. Baker (1955-7)
Lt. General Sir Oliver Leese, Bart., K.C.E., C.B.E., D.S.O. (1948-9)	G. V. Allen (1957-8)
A. DeB. Hovell (1949-50)	F. Bleazard (1958-9)
F. C. Atkins (1950-1)	Raymond Thompson (1959-60)
J. Stewart-Wood (1951-2)	P. B. Stanley-Evans (1960-61)
H. G. Boxall (1952-3)	G. C. Griffiths (Present)

**ALGERIA**

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**AUSTRALIA**

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Johnson, G. H., & N. C., 60 Railway Terrace, Riverstone, N.S.W.
Jones, H. & Co., (Sydney) Ltd., P.O. Box 21, Chippendale N.S.W.
King, W. & D., Myrtle Street, Blacktown, N.S.W.
Lachlan Mushroom Co., 22 Fitzroy Street, Cowra 3W, N.S.W.
Lawson, M., Lilyvale Mushrooms, Helensburgh, N.S.W.
Lesins, J., 16 Morgan Street, Sebastopol, Victoria.
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Mountain Mushrooms, Brewster Street, Mittagong, N.S.W.
Nugan, Richard A., Mt. Keira Road, Douglas Park, N.S.W.
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*Pick-Me-Up Food Products, Ltd.*, 42-60 Alice Street, Newtown, Sydney, N.S.W.  
Pixie Mushroom Company, Kurrajong, N.S.W.  
*Robotham, A.*, Church Street, Castle Hill, N.S.W.  
Schaeffer, C. F., "Kuttamulla," Wilberforce, N.S.W.  
Snowcap Mushrooms, 8 Excelsior Avenue, Castle Hill, N.S.W.  
Stewart, N. W., 156 Kline Street, Ballarat East, Victoria.  
Strathayr Mushrooms, Richmond, Tasmania.  
Thiele, W. J., 142 Surrey Road, Blackburn, Victoria.  
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Tom Piper Ltd., 4 Bruce Street, Waterloo, N.S.W.  
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Wakelyn-King, J., Bowral Mushroom Nurseries, 25 Kiama Street, Bowral, N.S.W.  
Walton, K., 27 Rennison Street, Parkdale, S.12, Victoria.  
Williams, A. L., Myponga Sawmills, Myponga.  
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- Hearne, Sqdn. Ldr. P. J. c/o Westminster Bank Ltd., Dunstable Road, Luton.  
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Saul, T. A., Ltd., Grange Farm, Riseley.  
Tucker, W. C. & M. E., Old Barn Farm, Gt. Gransden, Sandy.  
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## BERKSHIRE

- Belcher, W. S., Pine Drive, Wokingham.  
Burnell, R. D., Appletree, Sonning.  
*Fawcett, C. H.*, Burgess & Co. (Engs.) Ltd., Easthampstead Road, Bracknell.  
*Harries, D. J.*, Cooper's Lime Works, Pinkey's Green, Maidenhead.  
Hardy, S. R., "Ashdown," 28 New Road, East Hagbourne, Didcot.  
Miller's Mushrooms Ltd., Littlewick Green, Nr. Maidenhead.  
Nevill, F. I. R., Longwood and Culham Nurseries Ltd., Culham House, Culham, Nr. Abingdon.  
Stevenson, D., Royal Gardens, Windsor, Berkshire.  
Sutton Courtenay Croft Gardens Ltd., Hillier's Close Cottage, Sutton Courtenay, Abingdon.  
Taylor, R., Tokers Green Mushroom Farm, Rokeby Drive, Tokers Green, Near Reading.  
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Hughes, Major G. O., P.O. Box 120, Kiambu, Kenya.  
Thompson, L. B., P.O. Box 5571, Nairobi, Kenya.

## **BUCKINGHAMSHIRE**

Bird, H. G., Long Meadow, South Heath, Gt. Missenden.  
Cooley, E. C., Moor House Farm, Denham.  
Fryer, R. S., Nashleigh Mushroom Farm Ltd., Chesham.  
*Grant, Major C. P. E.*, Lowood, Wharf Lane, Bourne End.  
Hall, G. B., Tunfield Nursery, Hag Lane, Ashley Green, Chesham.  
Hannam, D. C., Denean, New Road, Great Kingshill.  
Newell, G. R. D., Westrow Mushroom Farm, London Road, Amersham.  
Stewart-Wood, J., Aylesbury Mushrooms Ltd., Ford, Nr. Aylesbury.

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## **CAMBRIDGESHIRE**

Gillett Bros., 7 Townsend, Little Downham, Ely.  
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Broadhurst, R. S., Cultivated Mushrooms, Lennoxville, Quebec.  
Carter Victor, 1731 Ash Road, Victoria, British Columbia.  
Chambers, Hugh, Lord Mushroom Farm, P.O. Box 11, Saint Jean, Quebec.  
Dominion Mushroom Co. Ltd., R.R.I.—Locust Hill, Ontario.  
Interprovincial Farm Feeds Ltd., 5022 St. Ambroise Street, Montreal 30, Quebec.  
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Tyrie, T. V., Roscobie Products Ltd., Tilston, Malpas.

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*Johnson Bros. & Co. (Derby) Ltd.*, Wholesale Market, Derby.

*Nightingale, M.*, "Amberley," Kelstedge, Ashover, Nr. Chesterfield.

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Coverley, H. D., Hartswood, Lydford, Devon.

Kearney, Captain M. N., "Four Corners," Wembury, Plymouth.

McArthur, G. M., Devon Mushroom Farm, Alfington, Ottery St. Mary.

Phillips, Cmdr. Lawrence H., Fourwinds Nursery, Georgeham, Nr. Braunton,

Randall, C. J., W. B. Randall Ltd., The Nursery, Rockbear, Exeter.

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Buckley, S., Irish Sugar Company Ltd., Thurles, Co. Tipperary.

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Butterly, L., Mushroom Grower, Channel Road, Rush, Co. Dublin.

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Carbide Ltd., Collooney, Co. Sligo.

Dudgeon Brothers, Killyleen, Ballinode, Co. Monaghan.

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Rathcoole Products Ltd., Rathcoole, Co. Dublin.  
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Cripps, Sydney F. N., Pond Chase Nursery, Folly Lane, Hockley, Essex.  
*Dench, R. W. Ltd.*, New Road, Rainham.  
Duthy, R., Greenacre Graded Mushrooms, Little Horkestone.  
*Everard, A. V.*, Whyteway, Basildon Road, Laindon.  
Gibbons, J. S., Takeley Nurseries Ltd., Takeley.  
*Harvey, B. H.*, Principal, Essex Institute of Agriculture, Writtle, Chelmsford.  
Helm, W., Glendale Nursery, Mayland, Chelmsford.  
Hopping, C. H., Pick Hill, Waltham Abbey.  
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Layer Mills Ltd., Layer de la Haye, Colchester.  
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Matthews, A. H. B., "Tylers", North Weald.  
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Mummery, L. S., Rosedene Nursery, Barling Road, Great Wakering.  
*Newman, G. H.*, "Pantiles," Stane Street, Takeley.  
*Pan Britannica Industries Ltd.*, Waltham Abbey.  
*Parker, John D.*, Rose Hill Farm, Leavenheath, Colchester.  
Payne, S. A. (Lea Valley) Ltd., Blacklands Nursery, Nursery Road, Nazeing.  
Peet, Dr. W. V., Timber Lodge, Coppet Hall, Epping.  
Pinkerton, R. H., Magees Nurseries Ltd., 26 Main Road, Hockley.  
Pipe L. H. & Sons, Smyatts Farm, Southminster.  
Powl, Robert G., 13 Mill Road, Mayland, Chelmsford,  
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Simons, J. E. R., Ltd., Natts Farm, Harlow.  
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Simpson, R. V., Oak Cottage, High Roding, Great Dunmow.  
Speller, R. L., Hoe Lane, Nazeing.  
Triangle Nursery Ltd., Rowney Farm, Harlow.  
Trimby & Sons, L. W., Applewood, Blackacre Road, Theydon Bois.  
Ward, G. C. P., Lime House Nursery, Rayleigh.  
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Mouton, G., Exploitation de Castelculier, B.P.1 Lafox, Lot-et-Garonne.  
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## GLOUCESTERSHIRE

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Newland Agricultural Products, The Tunnels Farm, Newland.  
Pearson, Air Commodore H. M., Mapleridge, Horton, Chipping Sodbury.  
Rennie, Major A. J., Lansdown Lea, Lansdown Road, Cheltenham.  
Rowley, J. D., Kingsheath Nurseries, Cribbs Causeway, Nr. Bristol.  
Turf Improvement Maintenance Ltd., 21 Rodney Road, Cheltenham.  
Wicks, G. A., Olveston House, Wotton-under-Edge, Cromhall.

## HAMPSHIRE

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*Cameron, R. J.*, Hearn House Farm, Headley, Bordon.  
*Arthur Coomer Ltd.*, Grove Road, Farlington, Portsmouth.  
*Dring, J. Ltd.*, The Airport, Portsmouth.  
Duguid, N. W. H., Kent's Oak Farm, Awbridge, Nr. Romsey.  
Enterprise Mushrooms, Branksome House, Waltham Chase, Southampton.  
Formby, D. J., Westbrook, Bridge Road, Park Gate.  
*Green, J. D.*, Hill Top, Swanmore, Southampton.  
Green, J. R. P., "Medina," Fleet End Road, Warsash.  
Hartley Bros. (Fair Oak) Ltd., Hill Pound Farm, Swanmore, Southampton.  
House, Charles, Haydown House, East Cholderton, Nr. Andover.  
*Huntington, J. R.*, Rockbourne, Nr. Fordingbridge.  
*Jerrard, D. H.*, Manor Cottage Stables, Winton Hill, Stockbridge.  
Lawrence, Capt. G. P., Barrow Hill, Goodworth Clatford, Andover.  
Livingstone, F. G., Hearn House Farm, Headley, Bordon.  
*Mackenzie, Capt. D. D.*, Bolder Mead, Lymington.  
New Forest Produce Ltd., Firtree View, Canada Common, West Wellow.  
Stickland, D. G., Greenaway Nurseries, Warsash.  
*Townsend, H. C.*, 118 London Road, Cowplain, Portsmouth.  
*Walden, R.*, 7 Richmond Gardens, Southampton.  
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*Edwards, R. S.*, Old Court, Staunton-on-Arrow, Leominster.  
Godfrey, P. F., Wanatchee Products, Much Birch, Hereford.

## HERTFORDSHIRE

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*Atlas Basket Co. Ltd.*, Atlas Works, Harpenden.  
*Bruce, H.*, 5 Gews Corner, Cheshunt.  
*Campbell, A.*, Rocam Nurseries, Bushey Heath.  
*Clarke, J. W.*, Oakwood 1a, Monkswood Avenue, Waltham Abbey.  
*Cranshaw, C. B.*, 235 High Road, Broxbourne.  
*Dean & Speller*, Conduit Lane, Hoddesdon.  
*Dunsby, M. C.*, 27 Crown Street, Redbourn.  
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*Humberstone, J. R.*, T. D. Bridger Ltd., Lorraine Works, Birds Hill, Letchworth.  
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Maxwell, A. J. Ltd., Albury Farm, Cheshunt.  
*Monro, Geo. Ltd.*, Technical Dept., Waltham Cross.  
*Murphy Chemical Co. Ltd.*, Wheathampstead, Nr. St. Albans.  
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## HOLLAND

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## JAPAN

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*Mitsubishi, Shoji Kaisha Ltd.*, Marine Products Dept., Division C, 20 Marunouchi, 2-Chome, Chiyoda-Ku, Tokyo.  
*Yamada, Koji*, c/o Nihon Reizo K. K., Kamagaya Shiken-Jo, 537-2 Kamagaya Kamagayo-Cho, Higashi-Katsushika-Ku, Tokyo.

## KENT

- Allen, George V., Bilting Cottage, Bilting, Ashford.  
Allnutt, Frere, Palmsted Hill House, Bekesbourne Lane, Nr. Canterbury.  
*Barrett, Mrs. M. E.*, Gore Court, Eastry, Sandwich.  
Birnam Mushrooms Ltd., Hammill Road, Woodnesborough, Nr. Sandwich.  
Blundell, Mrs. B., Bladbean Stud, Elham, Canterbury.  
Brett, J. W. "Wookey", Hallsfield Road, Bridgewood, Rochester.  
*Brown, A. B.*, Kingscote, Lusted Hall Lane, Tatsfield.  
Britcher, R., Little Court Lodge, East Farleigh, Maidstone.  
*Bugge's Insecticides Ltd.*, London Road, Sittingbourne.  
Collier, Sir Conrad, Fairbourne Manor, Harrietsham.  
*Collier, J. C.*, Fairbourne Manor, Harrietsham.  
*Cooper, Frank (Canterbury) Ltd.*, 2 Watling Street, Canterbury.  
Darland Agricultural Products, Estate Office, 119 Watling Street, Gillingham.  
Dredge, Major A. L. A., Combe House, Combe Bank, Sundridge.  
Field, Lt. Col. N. J. L., Fair Acres, White Hill, Bilting, Nr. Ashford.  
French, A. G., Batteries Farm, Lynsted, Sittingbourne.  
Gook, E. A., Hegdale Cottage, Boundgate, Badlesmere, Nr. Faversham.  
*Gregory, F.*, 8 Brackley Road, Beckenham.  
*Holmes, T. P.*, c/o Fairbourne Manor, Harrietsham.  
*Iles, W. D.*, 7 Maidstone Road, Lenham, Nr. Maidstone.  
*Ironside, W. L.*, Farthing Common, Lyminge, Folkestone.  
Jackson, R. L. O., Cedar Cottage, Broad Oak, Canterbury.  
*Lloyd, Lt. Col. C.*, Berengrove, Berengrave Lane, Rainham.  
Mount, H. & Sons Ltd., Woolton Farm, Bekesbourne, Canterbury.  
Oldfield, J. R., Doddington Place, Nr. Sittingbourne.  
Salvatori, David A., 123 Rough Common Road, Canterbury.  
Smith, E. N., Plantation House, Rhode Common, Faversham.  
Smith, G. C., Loddington Farm Ltd., Linton, Maidstone.  
Stanford-Tuck, Mrs. J., The Lynch, Eastry.  
Stedall, Major, G. St. G., Shearway Nurseries, Cherry Gardens, Folkestone.  
Turpin, D. F., New Barns Farm, Paddock Wood.  
Vyse, W. J., Foxden Lodge, Egerton, nr. Ashford.  
*Waters & Cooper Ltd.*, Forstal Road, Sandling, Maidstone.

## LANCASHIRE

- Beardsell, D. R., 6 Cable Street, Formby, Liverpool.  
*Blackburn (Manchester) Ltd.*, James, Smithfield Market, Manchester 4.  
Bleazard, F., C. Bleazard & Son Ltd., Cornwall Place, Blackpool.  
Bleazard, J. A., Mereside Mushroom Co., 21 Cornwall Place, Blackpool.  
Bradley, K. C., Lodge Lane Nurseries, Lytham.  
*Breakell, C. C.*, Annerley House, Garstang.  
*British Basket & Besto Co. Ltd.*, Irlam, Manchester.  
Bushell's Mushrooms Ltd., 35 Clifton Street, Lytham.  
*Cocozza, Wood (Manchester) Ltd.*, 21 Oak Street, Smithfield Market, Manchester 4.  
Coates, Fred., Rivelin Nurseries, Course Lane, Newburgh, Wigan.  
*Collins, Gordon Ltd.*, 23 Queen Square, Liverpool 1.  
Conroy, P. J. Ltd., Hope Street, Wigan.  
Culshaw, T. H., Carr Lane Nurseries, Tarleton, Nr. Preston.  
*Davey, T. W. Ltd.*, Smithfield Market, Manchester 4.  
*Davies, Lew (Smithfield) Ltd.*, Smithfield Market, Manchester 4.  
Dentith & Co., H. S., Wallworks Mushroom Farm, Manchester Road, Astley,  
Tyldesley, Lancashire.

## LANCASHIRE—contd.

Eatough, Kenneth J., "Bedouin", Boundary Lane, Hesketh Bank, Preston.  
Faulkner, H., Brent Mead, Firswood Road, Lathom.  
*Fitzpatrick, P. & T. Ltd.*, 22 Queen Square, Liverpool 1.  
Garner, W. R., Ridgmont Mushrooms, Moss Lane, Hesketh Bank, Nr. Preston.  
*Gleave, D. B.*, 113 Downall Green Road, Bryn, Nr. Wigan.  
*Grayling, D. A. H.*, Woodside, Garstang, Preston.  
*Hartley Ltd., R. & M. C.*, Lee Road Nurseries, Lee Road, Blackpool.  
Holcroft, Thomas, Moss Villas, Mere Road, Burscough.  
Holdsworth, H. D., Clayton House, Burscough.  
Houghton, J. & Sons, Winrow Farm, Scarisbrick, Ormskirk.  
*Howlett, T. & Co. Ltd.*, Strand Buildings, Cleveleys.  
Hunt, John, Torr's Farm, Walmer Bridge, Nr. Preston.  
Ibbotson, D. R., 41 Station Road, Hesketh Bank, Nr. Preston.  
*Kay, Wm. C.*, Old Brook Hall Farm, Bold, Nr. Widnes.  
Kettlewell, John C., Lea Rig, Flag Lane, Penwortham, Preston.  
Lawton, R., Lawton Bros., Oulderhill Nurseries, Taunton Ave., Rochdale.  
*Lewis, David J.*, Anfield Lodge, 13 Anfield Road, Anfield, Liverpool 4.  
Martland, R. G., Burscough Bridge, Ormskirk.  
Mawdesley, F. W., The Nurseries, Formby Fields, Formby Nr. Liverpool.  
Mellor L., 29 Green Avenue, Tyldesley, Manchester  
Mrs. Mulligan's Mushrooms Ltd., 1 Harcourt Road, Blackpool.  
Orritt, T., 48 Orrell Lane, Burscough Bridge, Ormskirk.  
*Paton, Major J. R.*, 12 Lentworth Drive, Scotforth, Lancaster.  
Prescott, Joseph, 14 Millbank Farm, Maghull, Nr. Liverpool.  
Rothwell, J. & Son, Little Hall Farm, Cottage Lane, Ormskirk.  
*Rothwell, M. Richard*, New Hall Farm, Scarisbrick  
Snaith, J. H. & F., 15 Oldfield Carr Lane, Hardhorn, Poulton-le-Fylde.  
*Stringman, F. L.*, "Ingelwood," Ashton Road, Golborne, Nr. Warrington.  
Turner, H., 17 West View, Kelbrook, via Colne.  
Wallbank, Wm., Church Farm, Banks, Nr. Southport.  
*Waterworth, F. & T., Ltd.*, 61 Cazneau Street, Liverpool 3.  
Watson, H., Rowe Farm, King's Causeway, Briefield, Nr. Nelson.  
*Watts, C. E.*, Geneva Gardens, Stockdale Road, Marton, Blackpool.  
Woods John (Farms) Ltd., Scorton Mushrooms, Hill Foot Farm, Scorton,  
Preston.

## LEBANON

Barnard, G., P.O. Box 3418, Beirut.  
The Middle East Mushroom Company, P.O. Box 4566, Beirut.

## LEICESTERSHIRE

Eady, H. K., St. Mary's Nurseries (Harborough) Ltd., Market Harborough.  
East Midland Growers, Great Bowden, Market Harborough.  
Hewett, Ivor, 26 Shepshed Road, Hathern, Nr. Loughborough.  
Marigold Nurseries Ltd., 41 Halford Street, Leicester.  
*Musson, R.*, Poplars Farms, Kirby-Bellars, Melton Mowbray.  
Noble, Edward, Sutton Hill Farm, Sutton-in-the-Elms, Broughton Astley.  
Paragreen, V. E. T., The Nursery, Gimson Road, Leicester.  
*Pratt, C. S.*, 11 Scotlands Road, Coalville.

## LINCOLNSHIRE

*Geest Industries Ltd.*, White House Chambers, Spalding.  
Marshall, S. E., The Mill, Butterwick, Boston.  
Titley, Bros., Ludford, Lincoln.

## LONDON

*Armero, Jaime*, The Spanish Fruit Syndicate, 19a London Fruit Exchange,  
Spitalfields, E. 1.  
*Bermondsey Mushroom Partnership*, 18-26 and 30-42 Maltby Street, S.E.1.  
*Bicknell, David T.*, 6 Findon Road, Shepherds Bush, W.12.  
*Bradley, F. C. & Sons, Ltd.*, 58/61 Piazza Chambers, Covent Garden Market,  
W.C. 2.  
*British Rototherm Co. Ltd.*, Merton Abbey, S.W.19.  
*Broome & Green Ltd.*, Covent Garden Market, W.C.2.  
*Capon, C. D. E.*, Farquharson Timber Ltd., Eldon Street House, Eldon  
Street, E.C.2.  
*Celcure Ltd.*, Aldwych House, Aldwych, W.C.2.  
*Collingridge, J. Ltd.*, 36 Wellington Street, Covent Garden, W.C.2.  
*Coleman Geo. (London) Ltd.*, Covent Garden Market, London, W.C.2.  
*Elliott, Thomas Ltd.*, Eagle Mills, 120 New Church Road, S.E.5.  
*Engert and Rolfe Ltd.*, Barchester Street, E.14.  
*Gaskell, E.*, 215 Victoria Park Road, Hackney, E.9.  
*Hicks, Richard (Provincial) Ltd.*, 65/9 Shelton Street, Covent Garden, London,  
W.C.2.  
*Hartman Fibre Co. Ltd.*, The, 5 Copthall Court, E.C.2.  
*Interpress Ltd.*, 12 Montague Street, W.1.  
*Knight, L.*, Brooklyn, Sewardstone, Chingford, E.4.  
*Knowles, Robert B.*, c/o Lloyds Bank, Hanover Square, W.1.  
*Lewis & Son Ltd.*, Edward H., 25 James Street, W.C.2.  
*Martin, Colin F.*, 27 Burford Road, Stratford Market, E.15.  
*Mizen, F. & G. (Boro.) Ltd.*, Borough Market, S.E.1.  
*Penny, A. C.*, 35 King Street, Covent Garden, W.C.2.  
*Poupart, T. J. Ltd.*, 110 Long Acre, W.C.2.  
*Prichard, J. R. (W. A.) Ltd.*, Mott Street Nursery, Chingford, E.4.  
*Rodgers, J. G.*, 4 Salisbury Road, S.E.17.  
*Ruzicka, H. J.*, 41 Queensborough Terrace, W.2.  
*Shirley Organics Ltd.*, Vicarage Wharf, Battersea, S.W.11.  
*Siller, R. S.*, 13 Mansel Road, Wimbledon, S.W.19.  
*Winter, J. L.*, 54 Ringstead Road, Catford, S.E. 6.  
*Woods, Wm.*, 3 Botolph Alley, E.C.3.  
*Wuille & Co., Dan*, Covent Garden Market, London, W.C. 2.  
*X-O-Matics (Sales) Ltd.*, P.O. Box 352, Henrietta House, Henrietta Place,  
W.1.

## MALAYA

Dixon, Prof. T. F., Faculty of Medicine, Singapore 3.

## MEXICO

Brown, Alfredo Beneitez, Coahuila 203, Mexico 7, D.F.  
Hongos de Mexico, S.A., Genova No. 39-200, Mexico 6, D.F.

## MIDDLESEX

Berry, A. J., The Dell Mushroom Farm, Reservoir Road, Ruislip Common.  
McGladdery, N., N. & A. W. McGladdery, Old Mill House, Old Mill Lane,  
Cowley.  
*Markes, R. H.*, "Tregellas," 180 Harefield Road, Uxbridge.  
*Market Sales Ltd.*, Brentford Market.

## NEW ZEALAND

Ansin, Leon, Waimarie Mushroom Farm, 150 Otonga Road, Rotorua.  
Bennett & Sons, Roadside Gardens, Rukuhia, R.D. 2, Hamilton.  
Dempsey, J. L., R.D.2, Hawkes Bay, Napier.  
Frost, R. W. A., P.O. Box 40, Levin.  
Growse, P. H., 60 South Karori Road, Wellington, W.3.  
Holst, L. D., N.Z. Mushroom Industries Ltd., 3 Anzac Avenue, Morrinsville.  
Lyster, N. J., 181 Colombo Road, Masterton, Wairarapa.  
MacKenzie, R. M., Dunbars Road, Halswell, Christchurch.  
Manurewa Mushrooms Ltd., 220 Kohimarama Road, Auckland, E.I.  
Ohaupo Mushrooms Limited, Great South Road, Ohaupo.  
Pexton, Lt. Comdr. M., Greenhithe Road, R.D.4, Albany, Auckland.  
Rickman, F., No. 2, R.D., Levin.  
*Trimol Laboratories Ltd.*, 71 Melrose Road, Mt. Roskill, Auckland.  
Stolph, M., Springston, Christchurch R.D.4.  
Wasmuth, V., P.O. Box 108, Henderson.  
White-Top Mushroom Co., Valley Road, Takanini.  
Williams, E. E., 16 Cochrane Street, Rotorua.

## NORFOLK

Blue Riband Mushroom Co. Ltd., The, Cromer.  
Britton, Major B. G., The Rookery House, Mundesley.  
Broadlands Mushroom Farm, White Street, Martham, Great Yarmouth.  
*Campbell's Soups Ltd.*, Agriculture Research Dept, King's Lynn.  
Gough, & Son, Ltd., F., Fishergate, Norwich.  
Hopper, I. K., Holmbush, Thornham, Kings Lynn.  
*Jermyn, J. L.*, Mill Farm Mushrooms Ltd., Ringstead, Kings Lynn.  
Marston, J. S., High London Farm, Shelfanger, Diss.  
Nommensen, D. M., "Bush Hill," Holt Road, Cromer.

## NORTHAMPTONSHIRE

Brown, H. A., Avalon, Peterborough Road, Faracet, Peterborough.  
*Gooding, J. A.*, Snowcap Mushrooms Ltd., Yaxley, Peterborough.  
Luxmoore, M. C., Snowcap Mushrooms Ltd., Yaxley, Peterborough.  
*Noble, B. A.*, Noble Mushrooms Ltd., Yaxley, Peterborough.  
Snuddon, C. C., Greenbank Cottage, Hargrave, Wellingborough.  
Terrell, F., The Grange, Yaxley, Peterborough.  
*Watson, Angus*, 1 West Street, Kings Cliffe, Peterborough.  
*White Queen Ltd.*, Yaxley, Peterborough.

## NORTHERN IRELAND

*Bates, Geo. & Son Ltd.*, St. George's Market, Belfast.  
*Dingwall, I. G. P., B.Sc.*, The Manor, Loughgall, Co. Armagh.  
Duffy, Patrick, Canark, Mok, Co. Armagh.  
Forsythe, W. J. & Son Ltd., Fairview Nurseries, Bangor, Co. Down  
Kernan, M., Aughatarra, Benburb, Dungannon, Co. Armagh.  
Kernohan, S. H., Lower Broughshane, Ballymena.  
Kettyle, James, Coolnamarrow, Magheraveely, P.O., Ennis Killen.  
*Lefroy, I.*, Ferns Hollow, Killaloe, Co. Clare.  
McBriar, R. J., Overdale, Saintfield, Belfast.  
*Moffett, John A.*, Drumcroon, Coleraine, Co. Derry.  
Monlough Food Production Co. Ltd., Ballygowan, Belfast.  
Moore, James, English Street, Co. Armagh.  
Nelson, R. G., Ballylumin, Ahoghill, Co. Antrim.  
Robb Bros., Meadowbrook Hatchery, Armagh Road, Newry.  
Taylor, Robert, Rex Products Ltd., Temple Patrick, Belfast.  
Young, Mrs. M. B., Mountsandel, Coleraine, Co. Londonderry.

## NORTHUMBERLAND

*Bird, J. P., Ltd.*, St. Andrew's Street, Newcastle-on-Tyne.  
*Davis, T. F.*, 7 St. Andrew's Street, Newcastle-on-Tyne 1.  
*Leatherland, G. E. Ltd.*, 20/22 St. Andrew's Street, Newcastle-on-Tyne.  
*Pearson, S. & Son*, 40 Green Market, Newcastle-on-Tyne 1.  
*Thurston, J. S.*, 31 Main Street, Spital, Berwick-on-Tweed.

## NORWAY

*Norsk Champignon, Wollebekk Gard, Okern, Oslo.*  
*Reffstrup, Knud, Wollebekk Gard, Okern, Oslo.*

## NOTTINGHAMSHIRE

*Arundel, D.*, 47 Hawton Road, Newark.  
*Bentley, A. J., Ltd.*, Frearson Farm, New Eastwood, Nr. Nottingham.  
*Bruszewski E. & Szott, Z.*, Podder Lane Mushroom Farm, Podder Lane, Off Mapperley Plains.  
*Bubess, E. T. & S., Old Hostel Mushroom Farm*, Derby Road, Eastwood, Nr. Nottingham.  
*Cwynar, S.*, Mushroom Farm, Bestwood Park, Nottingham.  
*Danks, P. K. L.*, Newstead Abbey, Nottingham.  
*Gryzan, L.*, 58 Musters Road, West Bridgford.  
*Gypsum Mines Ltd. The*, Kingston-on-Soar, Nottingham.  
*Hill, K.*, Sandycroft Farm, New Lane, Girton, Newark.  
*Kavell, W. L.*, Kavell's Mushroom Farm, Orston.  
*Kublicki, S.*, The Limes Mushroom Farm, 64 Acton Road, Long Eaton, Nottingham.  
*Lumb, Dr. Melvn*, 2 Kingswood Road, West Bridgford, Nottingham.  
*Nason F. R. Ltd.*, Avenue "B," Wholesale Market, Nottingham.  
*Ochenduszko & Oledzki*, Mapperley Mushroom Farm, 53 Clumber Avenue, Mapperley, Nottingham.  
*Reeve, Geo. H.*, Redmay Mushroom Farm, South Scarle, Newark.  
*Rhodes, George*, Westwood Nurseries, Jacksdale.  
*Tooley, C. W. & Sons Ltd.*, Wholesale Market, Nottingham.  
*Widdowson, Herbert*, The Grove, Cropwell Butler.  
*Wright, L. M.*, Tudor Farm, Elston, Newark.

## OXFORDSHIRE

*Doak, R.*, No. 1, Elmwood Bungalow, Black Bourton.  
*Dudley, Ivor*, 2 Elmwood Cottages, Black Bourton.  
*Vranesevic, B.*, Field Place Farm, Henley-on-Thames.

## PAKISTAN

*Khattak, A. K.*, 4 Koh-i-Noor Colony, Peshawar Road, Rawalpindi, West Pakistan.

## PORUGAL

*Continho, José G. R., R.* Cardat à Graça, No. 1-3°-B, Lisbon.  
*Fernandes, José Augusto dos Santos*, Rua da Conceicao, 35, 3t, Dto, Lisbon.  
*Jurado, Rafael Casau*, Rua Da Conceicao, 35, 3, Dto, Lisbon.

## RUSSIA

*Selsko-Khozjajstven, Biblioteka*, Orlikov per., 1/11, Moscow, U.S.S.R.

## RUTLAND

*Stocking, C. G.*, Bellfield, South Luffenham, Oakham.

## SCOTLAND

- Alexander, Miss E. K., Red House Mushrooms, Bridge of Allan, Stirlingshire.  
Allsop, H. S., Kingsley, Fennwick Road, Kilmaurs, Ayrshire.  
Beveridge, John & Co. Ltd., Bridgend, Kinross.  
*Brown, H. D.*, 45 Beechwood, Wishaw, Lanarkshire.  
*Caldwell, J. A.*, "Monaebrook," Helensburgh, Dumbartonshire.  
Dumbreck, R. D., Mossiel, Dysart, Fife.  
*Galbraith, W. S.*, Albethy, Bridge of Allan, Stirlingshire.  
Harris, R. M., 1 Kintillo Gardens, Bridge of Earn, Perthshire.  
*Henry, James, R.*, 1 Wemyss Place, Haddington, East Lothian.  
*Lessells, H. C.*, Perth Arms Hotel, Dunkeld, Perthshire.  
Lockwoods Fruit Farms, Turin Home Farm, Forfar, Angus.  
*McKay, Ronald*, Edgenhill Cottage, Culter House Road, Mill Timber, Aberdeenshire.  
*Mitchell, W. A. B.*, The Old Mill, Pitlochry, Perthshire.  
Oliver, A. P., The Mushroom Sheds, Buckholme Mill, Galashiels.  
*Pinkerton's Scottish Mushroom Laboratories*, Millerston, Glasgow.  
Simpson, Thomas, Cutcloy Farm, Whithorn, Newton Stewart, Wigtownshire.  
Stratton, T., Aberagie, Abernethy, Perthshire.

## SHROPSHIRE

- Giles, Peter, Meadow View, Morda Road, Oswestry.

## SOMERSET

- Abraham, B. D.*, Dipford Barton, Trull, Taunton.  
Callow, F. E. J., Windy Ridge Nurseries, Axbridge.  
*Eclipse Peat Co. Ltd.*, Ashcott.  
*Gartell, A. G.*, Common Lane Farm, Templecombe.  
Griffiths, G., Wrington Vale Nurseries, Congresbury.  
Hansford, W. F., Colwyn Farm, Tintinhull, Nr. Yeovil.  
*Lloyd, J. H.*, Shrub Farm, Brent Knoll, Nr. Highbridge.  
Pointing, A. G., 39, Lucklands Road, Weston Park, Bath.  
Pointing, S., Byfield Farm, Combe Down, Bath.  
*Pointing, Ian J.*, Sulis Manor, Bath.  
Pratten, J., High Acres Nurseries, Tunley, Nr. Bath.  
*Robertson, Ian*, 3 Elm Place, Bath.  
*Rodwell, J. H. D.*, c/o The Wrington Vale Nurseries Ltd., Congresbury.  
*Whebber, P.* Little Quarne, Wheddon Cross, Minehead, Somerset.  
Wilson, Major D. A., The Steeple, West Camel, Yeovil.

## SOUTH AFRICA

- Apthorp, R. M., Stellenberg Mushroom Farm, P.O. Koelenhof, Cape Province,  
Bloomfield Bros., Labda Farm, Sir Lowry's Pass, Cape Province.  
Braeside Mushroom (Pty.) Ltd., P.O. Box No. 77, Hillcrest, Natal.  
Burton-Hogan, Major J. J., 9 Russell Road, Port Elizabeth.  
Chitters, Dr. Max, Medical Centre, 1006-8 Jeppe Street, Johannesburg.  
Christmas, D. C., P.O. Box 280, Marandellas, S. Rhodesia.  
Denny, W. L. M., Everglades Mushroom Farm, P.O. Lyndhurst, Johannesburg.  
*Dippenaar, Prof. Barend J.*, University of Pretoria, Pretoria.  
East Lynn (PVT) Ltd., P.O. Box 128, Umtali, S. Rhodesia.  
Garthorne, D. S., Morning Dew Mushrooms P.O. Box 202, Johannesburg.  
Hillcrest Mushrooms, P.O. Box 75, Hillcrest, Natal.  
Hulley, P., Orkney Farm, P.O. Box 455, Umtali, Southern Rhodesia.  
Kark, Dr. Charles, Box 20, Sandown, Johannesburg.  
Kumst, Cyril, Lot 35 Epsom Road, Newmarket Estates, Alberton.  
*Louw, Dr. P. G. J.*, P.O. Box 87, Lyttelton.  
Nothard, A. P., P.O. Box 103, Broughton, Johannesburg.  
Robertson, Mrs. H. F. G., P.O. Box 93, Bergvlei, Transvaal.  
*Skeels, W. R.*, "Midhurst," Constantia, Cape.  
Vorster, Mrs. A. J., "Ruijte", P.O. Box 430, Springs, Transvaal.

## SOUTH AMERICA

- Beck, Alfred, Apartado Aereo 6465, Bogota, Colombia.  
Canto, Alfonso, Casilla 13305, Santiago, Chile.  
Delrio Alimentos Industrializados, Estrada de Itapecerica, 6109, Caixa Postal 11225, Sao Paulo, Brazil.  
Hirsch, Dr. J. M., Apartado 4625-Este, Caracas, Venezuela.  
Kelsey A. E. Pringles 202 Temperley, Buenos Aires, Argentina.  
*Linky, Raul*, Casilla de Correo 596, Montevideo.  
Marechal, Luis le, 547 Rua Haddock Ladd, Sao Paulo, Brazil.  
Rhodes, J., de Compania Colombia de Seguros, Dpto. Legal, Bogota, Colombia.  
Thibaud, Michel, Avenida Quintana, 944, Buenos Aires.  
Woiski, Joao S., a/c Sr. M. Magagge, Rua Julia da Costa 9, Parangua, Parana, Brazil.

## SPAIN

- Dumora, J. Roca, Alfonso XII, 32 Atico 3a, Barcelona (6).  
Eguiluz, Antonio Morales, Avda. de Los Toreros, 75, Madrid.

## STAFFORDSHIRE

- Brown, P. C. & Co., The Birches, The Coppice, Biddulph, Stoke-on-Trent.  
Brammer, J. D., Wood Farm, Bagnall, Stoke-on-Trent.  
Dajnowicz, S. & Y. M., Bonehill Mushroom Farm, 25 Park Lane, Bonehill, Tamworth.  
*Dickinson, Thomas*, Wholesale Market, Wolverhampton.  
*Dingley, Alan*, 84 Station Road, Polesworth, Tamworth.  
Homer, C. H., 139 Waterfall Lane, Blackheath.  
Needwood Farms Ltd., Home Farm, Kings Standing Needwood, Burton-on-Trent.  
Skidmore, D. A., Moss Close Farm, Buchanan Road, Walsall.

## SUFFOLK

- Duncan-Jones, Major W.*, M.E.M. Enterprises Ltd., Milburn Close, Moulton, Newmarket.  
*Griffiths, D.*, Amento, Moulton, Newmarket.  
*More, A. R.*, Agricultural Contractors Ltd., 42 Abbeygate Street, Bury St. Edmunds.  
Piatkowski, Capt. S., Town Pightle, Dunwich Lane, Peasenhall, Saxmundham.  
*Steward, B. A.*, Thorpe Grange Farm, Trimley, Ipswich.  
Thomas, L. S., Gt. Welney, Bury St. Edmunds.

## SURREY

- Adby, F., Weydon Hill Nursery, Farnham.  
Ady, John & Co. Ltd., Rowly Drive, Cranleigh.  
Arajs, A., Park Lane Mushroom Farm, Park Lane Merrow, Guildford.  
*Barnall, D. H. K.*, Overmist, The Avenue, Tadworth, Surrey.  
Baker, G. W., Broadham Produce Co. Ltd., Station Road, Oxted.  
Batchelor, J. G., Borrow House, Churt.  
Blacker, C. B., 2 Firgrove Hill, Farnham.  
Bowles, Dr. V. H., Brightleigh Farmhouse, Outwood, Nr. Redhill.  
*Brown, George*, Crosswater Farm Cottage, Churt.  
*Burrows, S.*, 105 Oaks Avenue, Worcester Park.  
*Bushell, D. C. & Co. Ltd.*, Sandhurst Mills, Camberley.  
Carew-Shaw, E., Courtlands, Shipley Bridge, Horley.  
Dalton, D. N., Leigh Mill House, Godstone.  
*Expanded Rubber Co. Ltd.*, 675 Mitcham Road, Croydon.  
Faithfull, W., Eashing Park Market Garpen, Nr. Godalming.  
*Figgis, T. G.*, Pine Lodge, Coldharbour Road, West Byfleet.  
Fillis, W. J. J., Pear Tree Cottage, 18 Folly Hill, Farnham.  
*Gardner, J. R.*, Riddings Cottage, Harestone Hill, Caterham.

## SURREY—contd.

- Gardner, R. W., Crofton, 9 Glendale Drive, Burpham, Guildford.  
Hall, A., 4 The Gallop, Sutton.  
Harrington & Jessop, 57 Abbey Road, Horsell, Woking.  
Heather Farm Ltd., Horsell Common, Woking.  
International Heating & Ventilating Co. Ltd., 4 Denbigh Gardens, Richmond.  
Jones, A. D., "Hythings," Station Road East, Oxted.  
Millais, E. G., Crosswater Farm, Churt.  
Moon, A. J. K., Chellows Park, Crowhurst, Lingfield.  
Oliver, F., Elmhurst, 91 Epsom Road, Guildford.  
Reed, Guy, Riverdale Mushroom Farm, Send Road, Old Woking.  
Rudkin, T. J., Highfields Nurseries, Big Common Lane, Bletchingley.  
Shackleford Nurseries Ltd., Eashing, Nr. Godalming.  
Smith, Trevor A., "Burrington," Welcomes Road, Kenley.  
Sparling, T. A. G., Bridges Wood, Burstow, Nr. Horley.  
Stevens, P. J., "Shrapnels," Old Byfleet.  
Tomlinscote Farm, The Manager, Chobham Road, Frimley, Camberley.

## SUSSEX

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